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27. (Amended) The device of claim 26 wherein a combined thickness of the oxide layer, the layer of undoped silicate glass, the layer of borophosphorous silicate glass, and the second layer of plasma-enhanced tetraethyl orthosilicate is less than 15,000 angstroms.

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#### REMARKS

Claims 1-4, 6, 7, 9, 10, 20, and 22-27 are currently pending.

As to section 1 of the office action, enclosed are amendments to the specification.

As to section 2 of the office action, enclosed are amendments to claims 2, 4, 26, and 27.

As to sections 3 and 4 of the office action, enclosed are amendments to claims 4 and 27 removing the word, "approximately."

As to section 5, the Applicants respectfully disagree with the office action's position that "... the planarized layer of plasma enhanced tetraethyl orthosilicate (PETEOS) is deposited all over the borophosphorous silicate glass (BPSG) layer" to support a proposition that claims 1, 5, and 16 incorrectly claim a planarized layer of plasma enhanced tetraethyl orthosilicate over at least a portion of the layer of the borophosphorus silica glass layer.

It is true that Figure 4 of the patent application shows a first layer of PETEOS deposited over a borophosphorous silicate glass layer, however, as shown in Figure 4, this PETEOS layer is **not planarized**. The position of office action contested herein deals with a planarized PETEOS layer, so Figure 4 of the patent application does not support the position taken in the office action.

Furthermore, contrary to the office action's position, Figures 5 and 6 show the first layer of PETEOS, after it has been planarized, in which the planarized layer of PETEOS **covers less than all** of the BPSG. As stated in the specification on page 4, lines 20 – 21, "the layer 38 is polished until the BPSG layer 6 is exposed." This is one exemplary embodiment supporting statements made in claims 1, 6, 20 to the effect that a planarized layer of PETEOS is not overlying at least a portion of a BPSG layer or that a first substantially planar layer of dielectric material is exposing at least one or more extended portions of a layer of doped silicate glass.

In addition, Figure 6 also shows a second layer of PETEOS **covering** a portion of the **BPSG** layer, which was exposed after planarization of the first PETEOS layer. As stated in the specification on page 5, lines 1-2, “an optional redeposition layer 46 may be formed on layer 38.” In this regard, the second layer of PETEOS prevents the first planarized PETEOS layer from covering the BPSG, so the office action’s position that the planarized PETEOS covers all of the BPSG is also not correct for another reason.

As to sections 7 and 8 of the office action, Claim 1 was rejected under 35 U.S.C. § 103(a), as being unpatentable over U.S. Patent No. 6,127,261, issued to Ngo et al. (“Ngo”), in view of U.S. Patent No. 5,503,882, issued to Dawson (“Dawson”). The status of claims 6 and 20 regarding possible 35 U.S.C. § 103(a) rejections is unclear since such rejections were not explicitly stated as being so rejected. The Applicants respectfully request that a new non-final office action be issued to clarify the status of claims 6 and 20 and their dependent claims regarding possible 35 U.S.C. § 103(a) rejections. In the event that claims 6 and 20 have been similarly rejected under 35 U.S.C. § 103(a) as claim 1, the Applicants offer the following discussion regarding the rejection of claim 1 under 35 U.S.C. § 103(a) as well as a possible response to similar rejections under 35 U.S.C. § 103(a) of claim 6 and 20 if applicable.


The office action admits that Ngo fails to teach forming a second layer of PETEOS overlying the planarized layer of PETEOS and directly overlying and being in contact with at least a portion of the BPSG. The office action offers Dawson to teach a second layer of PETEOS, however, this is not enough to teach or suggest all aspects of claims 1, 6, and 20. For instance, claim 1 recites in part, “a layer of plasma enhanced tetraethyl orthosilicate . . . directly overlaying and being in contact with at least a portion of the borophosphorus silicate glass region . . . .” Claim 6 recites in part, “a dielectric layer disposed on . . . the portions of the borophosphorus silicate glass which are not overlaid by the planar dielectric layer . . . .” Claim 20 recites in part, “a second layer dielectric material . . . being in direct contact with the at least one or more extended portions of the layer of the doped silicate glass layer.” Dawson fails to teach or suggest a PETEOS layer directly covering at least a portion of a doped silicate glass such as a BPSG layer, so Ngo and Dawson, both alone and in combination, at least fail to teach and suggest the above recited portions of claims 1, 6, and 20. Consequently claims 1, 6, and 20 are in condition for allowance. Claims 2-4, 7, 9, 10, and 22-27 are also in condition for

allowance based at least in part upon their dependencies on the allowable independent claims 1, 6, and 20.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version With Markings to Show Changes Made.**"

All of the claims remaining in the application are now allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,  
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at line 10 of page 4 has been amended as follows:

Referring to Figure 4, a layer 38 is formed over the BPSG layer 6 before CMP. In one embodiment, the layer 38 is conventionally formed from plasma-enhanced tetraethyl orthosilicate (PE-TEOS). The layer 38 acts as a sacrificial layer for the CMP process. In one embodiment, the thickness of the layer 38 is between approximately ~~8k~~8,000 – 20,000 angstrom, for example about ~~12k~~12,000 angstroms. The thickness of the BPSG layer 6 is between approximately ~~1.5k~~1,500 – 8,000 angstroms, for example ~~6k~~6,000 angstroms. The thickness of the USG layer 4 is between approximately ~~1k~~1,000 – 3,000 angstroms, and the thickness of the field oxide 2 is between approximately ~~3k~~3,000 – 6,000 angstroms.

Paragraph beginning at line 19 of page 4 has been amended as follows:

Referring to Figure 5, after the layer 38 is formed, the structure 1 then goes through the CMP process. In one embodiment, the layer 38 is polished until the BPSG layer 6 is exposed. In another embodiment, the polishing stops before the BPSG layer 38 is exposed. In yet another embodiment, the polishing endpoint is empirically determined using a test wafer (not shown). Alternatively, endpoint data provided by the manufacturer of the CMP equipment may be used. After the CMP, the combined thickness ~~yk~~ of all layers, *i.e.*, measured from the bottom of the field oxide 2 to the top of the layer 38, is between approximately ~~8k~~8,000 to ~~15k~~15,000 angstroms. In one embodiment, ~~yk~~ is approximately ~~13k~~13,000 angstroms. Thus, the layers 4 and 6 and the polished layer 38 together compose the PMD stack 20.

Paragraph beginning at line 1 of page 5 has been amended as follows:

Referring to Figure 6, subsequent to the CMP, an optional redeposition layer 46 may be formed on the layer 38. In one embodiment, the layer 46 is formed from PE-TEOS, has a thickness of approximately ~~2k~~2,000 angstroms, and composes part of the PMD 20. In another embodiment, the layer 46 is formed from TEOS.

In the Claims:

Claims 2, 4, 26, and 27, have been amended as follows:

2. (Amended) The structure of claim 1 wherein the layer of borophosphorous silicate glass has a thickness between approximately ~~2,000k~~ and ~~8,000k~~ angstroms.

4. (Three Times ~~Twice~~-Amended) The structure of claim 3 wherein a combined thickness of the oxide layer, the layer of undoped silicate glass, the layer of borophosphorous silicate glass, and the second layer of plasma-enhanced tetraethyl orthosilicate is less than ~~approximately 15,000k~~ angstroms.

26. (Amended) The device of claim 25 wherein the layer of borophosphorous silicate glass has a thickness between approximately ~~2k~~2,000 and ~~8k~~8,000 angstroms.

27. (Amended) The device of claim 26 wherein a combined thickness of the oxide layer, the layer of undoped silicate glass, the layer of borophosphorous silicate glass, and the second layer of plasma-enhanced tetraethyl orthosilicate is less than ~~approximately 15,000k~~ angstroms.